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For the Advocate of Science.

GEOLOGY, No. 16.

Having completed my brief sketch of the several classes into which the ata are divided, there remain for consideration only a few subjects, some which cannot properly be examined under the head of any of the classes. ese are, shifting sands and sandy deserts; putrefaction and the gradual rmation of limestone; coral reefs; peat and peat moors; the formation of llies; mineral veins; and the origin of coal.

Tertiary sands, forming deserts.—When describing the tertiary strata, I efly referred to shifting sands as belonging to that class; but for the sake conciseness the subject was not investigated in that place. The sands luded to are such as occur in various parts of the earth, often forming vast d barren deserts. The principal of them are found in Persia, Arabia, rica, and at the foot of the Rocky Mountains, in America.

Mode of fixing sandy soils.—The degree to which the tertiary sands are ted on by winds, is often astonishing. In Thibet, the inhabitants are rced to inundate the plains with water during the windy season, both to sure to them the possession of the soil, and to fertilize it. A preferable thod of accomplishing the same purpose is to plant grass, shrubs and es. On some parts of the English coast, and on the borders of the Bay Biscay, this expedient is resorted to.

Shifting sands in Maryland.—In Caroline county, and some other parts of aryland, where these sands prevail, it is not uncommon for the surface of e fields to be literally blown off by the winds. The grain which has just en sown in one field is thus blown into another. On this account the nd is sometimes styled, jestingly, *moveable property*.

Houses and towns buried in sand.—The shifting of the sands along parts f the coast of England exposes to view the tops of buildings that have en buried for many ye[illegible]. In Abyssinia the sand is carried up by the nd in the shape of enormous pillars, which are subsequently observed eeping furiously in different directions across the plains. Whole vilges and towns have been buried on such occasions. The ancient cities of yre and Sidon have been partly covered by the same means. The drifting nds of the Lybian desert are sometimes wafted by the winds over the ountain barrier interposed between it and the fertile banks of the Nile, nd the country is so overwhelmed that no other marks of vegetable life are ft but the tops of a few palm trees, which, together with the roofs of uildings, only serve to add to the dreariness of the scene.

Destruction of the army of Cambyses.—Travellers and caravans are not unfrequently buried in these inundations of sand. The traveller Bruce gives lively narrative of one, from which he and his retinue narrowly escaped. n one of these terrible inflictions perished the victorious army of Cambyses, fter it had ravaged the plains of Ethiopia, "lust in the van, and rapine in he rear." An animated, though florid, description of this catastrophe is iven by Darwin:—

> "Tinged by the crimson sun, vast columns rise
> Of eddying sands, and war amid the skies;—
> In red arcades the billowy plain surround,
> And whirling turrets stalk along the ground.
> Onward resistless rolls the infuriate surge,
> Clouds follow clouds, and mountains mountains urge.
> Wave over wave the driving desert swims,
> Bursts o'er their heads, inhumes their struggling limbs.
> Man mounts on man, camels on camels rush,
> Hosts march o'er hosts, and nations nations crush.
> Wheeling in air, the winged islands fall,
> And one great earthy ocean covers all."

Consolidation of sand into sandstone.—Not unfrequently the loose sands become cemented together, forming a kind of sandstone. Most probably all sandstones were once in the loose form.

Calcareous sandstone, containing human skeletons.—It often occurs that the drifting sands on the sea shore cohere together with minute particles of shells, forming a *calcareous sandstone*, belonging to the tertiary class. Imbedded in a rock of this kind, in Gaudaloupe, a human skeleton was found some years since. A similar discovery has been made in France, and another in Cornwall, both in a recent formation of this nature.

Human skeleton in coal.—A perfect skeleton was dug up, not long since, from a coal mine in England, seventy-five feet below the surface. But after it had puzzled all the geologists in the nation, and had well nigh started some new theories of the earth, it was found to have been deposited there by means of a pit that had been worked many years before, and afterwards filled.

Human skeletons in a cavern in France.—In the southern part of France, a cavern has recently been explored, the entrance of which is a fissure in the rock, five feet long, and one and a half in width. A narrow passage of the same dimensions, extends twenty feet in perpendicular depth, the descent of which is accomplished by pressing the back and knees against the rugged sides, after the manner of chimney sweepers. A horizontal passage thence leads to a low cave, in which there are many human bones mingled with the earthy paste, which unites them. The manner in which these bones were deposited, has not been satisfactorily determined.

Recent formation of limestone.—Connected also with the tertiary class, are those rocks which have been deposited from rivers and running waters holding lime in solution. Wherever the water is able to evaporate, the lime which it contained is left adhering to the surface. In this way the splendid columns of the grotto of Antiparos, and all the pendants and concretions of limestone caverns generally, have been formed.

Deposition of limestone from rivers.—In the plains of Caramania in Persia, is a river raised above the surrounding country by the great quantity of lime deposited from its waters. Most of the houses in the neighborhood of Matlack springs, in England, are built of a limestone deposited from those waters. The waters of the far-famed Geyser springs of Iceland contain a large quantity of silex and lime, which they deposit on cooling, and thus thickly incrust the channels in which they flow. At Tivoli, in Italy, is a similar deposit, of which nearly all the buildings of Rome are constructed, even the magnificent front of the church of St. Peter. During the reign of Augustus, so much calcareous matter was deposited at a cataract on the Neva as to endanger the adjacent country by obstructing the course of the river. On this account the Roman senate despatched Marcus Curius to turn its course through the territory of a neighboring nation, the Interamnates, which induced them to complain lest the petrifying stream might convert their lands into barren rocks. But the Reatines, at whose instigation the senate had made the change, being supported at Rome by the eloquence of Cicero, the others were forced to submit. Similar complaints were afterwards made by the several parties; and the deposition has since gone on so rapidly as to change repeatedly the bed of the river.

Ill consequence of using limestone water.—In districts where limestone abounds, the water of the springs is apt to be impregnated with lime. The use of it for drinking is not commonly injurious to health; but water of this kind, not dissolving soap with facility, is not well adapted for washing. "Hard water" is nothing more than water with lime, and often other substances in solution. The most serious consequence resulting from the use of limestone water for culinary purposes, is the deposition of the lime, by which the spouts of tea-kettles are often filled up!

The process of petrifaction explained.—Waters which contain mineral substances in solution, and deposit them afterwards, are called petrifying waters. The substances most frequently dissolved are lime, silex, and iron. The process of petrifaction is accomplished by the gradual removal of the

minute particles of the body to be petrified, and the deposition of the stony particles in their stead. Thus, a petrified body is not properly *changed into stone*, the particles which originally formed it having been entirely removed.

Impregnation with mineral matter, without petrifaction.—It sometimes happens that the petrifying water penetrates porous substances, and deposits the mineral particles without removing the original substance. The late Dr. Fothergill, it is said, perceived, while walking the streets of London, that his staff produced a peculiar sound in striking on the stones immediately under the large iron sign rods. On examination, he found that the iron constantly dripping from the rods had so impregnated the stones that their hardness resisted any common instrument.

Substances capable of being petrified.—There are few substances capable of resisting the action of petrifying waters. Not many years ago, the wreck of a vessel, which had been stranded on the Scottish coast thirty years before, was brought into view by a storm; when pieces of iron, of rope, and of wood, were found alike penetrated with stony matter. Trees of large size are often discovered under the earth's surface, in a petrified state, either by silex or iron pyrites.

Petrifaction of animal substances. By means of this process nature has transmitted to us the valuable history of ages, during which our globe was inhabited only by inferior races of animals. The material mostly employed for this purpose is silex. Occasionally pyrites of iron is substituted. Bakewell relates an instance of several mice, which had dropt into a solution of copperas or sulphate of iron, and remained a length of time, and were found incrusted with bright crystals of iron pyrites. The newspapers have circulated an account of the body of a man, which on being disinterred recently in New York, was found to be completely changed into stone.

I will complete the subject of these essays in two or three more numbers.

S.

For the Advocate of Science.

CUVIER'S CLASSIFICATION OF ANIMALS.

In a series of numbers on "System or Classification," I have presented to the readers of the Advocate of Science an outline of the method adopted by Linnæus, in arranging the objects embraced by the study of the animal world. I then briefly referred to another system, more modern, and not yet generally adopted—the system of Cuvier, a French naturalist, the most eminent of the present age. This system has advantages over that of Linnæus, being much more natural; that is, dividing animals into groups or families, the individuals of which more generally resemble each other. Thus, by the mode of Linnæus, man is associated in the same order with the bat; the cat with the seal, and the mouse with the porcupine. The modern system does not throw together such dissimilar animals.

In order to give the reader a bird's eye view of the two methods, I will revert to that of Linnæus so far as to present the following synopsis of it:—

Classes—I. Mammalia, or suckling animals. II. Aves, or birds. III. Amphibia, or serpents and reptiles. IV. Pisces, or fishes. V. Insectæ, or insects. VI. Vermes, or worms, comprising shell fish, the coral and sponge animals &c.

Orders of class I. Mammalia. 1. *Primates*, or chieftains, having four cutting teeth in each jaw, as man, the monkey tribes, bat &c. 2. *Bruta*, or brutes, which have no front teeth in either jaw, as the elephant, rhinoceros, dolphin. 3. *Feræ*, or savages, which have from two to ten front teeth in each jaw, and a solitary tusk, or carniverous tooth, on each side of both jaws, as the bear, dog, cat, wolf, seal. 4. *Glires*, or hibernators, which have two fore teeth in each jaw, remote from the other teeth, as the beaver, rat, squirrel. 5. *Pecora*, or cattle, which have no front teeth in the upper jaw, and six, seven, or eight in the lower, four stomachs, and parted hoofs, as the cow, camel. 6. *Belluæ*, or warlike animals, which have front teeth in both jaws, and hoofs, as the horse, hog. 7. *Cete*, or the whale family, as the whale, porpoise, grampus.

Orders of class II. Aves. 1. *Accipitres*, or birds of prey, as the eagle, hawk. 2. *Picæ*, pies or climbers, as the parrot, woodpecker. 3. *Anseres*, or webfooted, as the goose, duck. 4. *Grallæ*, or waders, as the crane, heron. 5. *Gallinæ*, or gallinaceous, as the domestic fowl, pheasant. 6. *Passeres*, comprising the singing birds, as the nightingale, lark.

Orders of class III. Amphibia. *Reptilia*, or reptiles, as the lizard, crocodile, frog. 2. *Serpentes*, or serpents.

Orders of class IV. Pisces. 1. *Apodal*, or without fins, as the eel, torpedo. 2. *Jugular*, having the ventral or belly fins *before* those of the chest, as the cod. 3. *Thoracic*, having the ventral fins *under* those of the chest, as the perch. 4. *Abdominal*, having the ventral fins behind those of the chest, as the herring. 5. *Soft-gilled*, having soft gills without bones, (unlike the preceding,) as the frog fish. 6. *Cartilage-gilled*, having gills composed of gristle, as the sturgeon.

Orders of class V. Insectæ. 1. *Coleoptera*, or shelly-winged, as the beetle, blistering fly. 2. *Hemiptera*, or half shelly-winged, with two shelly-wings, and two soft ones, as the roach, bed bug. 3. *Lepidoptera*, or scaly winged, as the butterfly, moth. 4. *Neuroptera*, or net winged, with four thin network wings, as the dragon fly. 5. *Hymenoptera*, with four membrane-like wings, as the bee and wasp. 6. *Diptera*, or two winged, as the fly, mosquito. *Aptera*, or wingless, as the ant, flea, louse.

Orders of class VI. Vermes. 1. *Intestinales*, having no limbs or covering, as the earth worm, leech. 2. *Mollusca*, or soft bodied worms, having no covering, but supplied with limbs, as the ship worm, shrimp. 3. *Testacea*, or shelly, as the oyster, muscles. 4. *Zoophytes*, or plant animals, as the coral, sponge. 5. *Infusoria*, or infusory, consisting of animalcules, found in vinegar &c.

In general, the distinctive characters of these divisions may be intelligible to every understanding. If the reader chooses, he may refer to the essays before alluded to, in which they are examined more in detail. It will be at once perceived that some of the orders depend on characters which render their separation from others very arbitrary. On this account the anomalous associations before noticed are not unfrequent; and on this account, principally, is the system of the Swedish naturalist objected to. The system of Cuvier, on the other hand, rests on the anatomical structure of animals, and consequently is more scientific, and more natural. I will present a synopsis of it in my next essay.

ARANEA.

(*To be continued.*)

For the Advocate of Science.

SHOOTING STARS.

In a late number of the Advocate, I observed an interesting article in "Reply to the query respecting Shooting Stars." After stating and refuting several theories, the writer remarks, that "Humboldt is decidedly of opinion that meteorites are foreign to the confines of our atmosphere," but does not state his theory, or whether he has any definite theory. It would have been very gratifying to me had this writer pursued the subject further. To those who are not satisfied with merely observing natural phenomena without inquiring after their causes, the origin of meteoric stones must be a question of deep interest.

Upon reading the article above alluded to, a thought occurred to me respecting these bodies, which, so far as I then knew, was original. On referring to another treatise on that subject, however, I discovered an hypothesis not altogether unlike mine. It was there stated, as a conjecture of some philosopher, that "they are fragments of terrestrial comets." These "terrestrial comets," I infer from what is said in another place, are conjectured to be fragments

the supposed planet out of which the four asteroids in our system ere produced, being driven off from the body with such force, as to ll without the sphere of its attraction. These fragments, the ad-cates of the theory suppose, in coming to their perihelion, (for such rojectile force must necessarily subject them to very excentric bits,) dip into the atmosphere of our earth, and in passing through become ignited, and small portions of it explode, and fall to the rth.

I am aware that mere hypothesis is of little worth; still, as hy-thesis is all we are likely ever to hear on this subject, it may not amiss to offer such reflections as have occurred to me. My eory, then, is this. I suppose there may have been, perhaps, from e period of the creation, numerous small *invisible* satellites, re-lving round our earth, like the moon. How they came there, do not take it upon myself, neither do I consider it necessary for e, to show. It is, I suppose, just as easy to account for the ex-ence and locality of *many little* moons, as it is for *one great* oon; or indeed for any of the planets, either primary or second-y. Perhaps, originally, the earth had several moons, and that all t one met with a fate similar to that of the supposed planet, whose ins gave birth to the asteroids; or perhaps both the earth and e moon, as well as these smaller fragments, are but parts, or se-rate accumulations from the original mass of chaotic matter, des-ed, upon the establishment of the laws of gravity and motion, to ld the place in the solar system which we find them occupying. owever this may be, I deem it sufficient for my present purpose remark, that there is no more difficulty in supposing such bodies exist, either at comparatively small or great distances from the rth, than for the moon or the satellites of the other planets to be nd detached from and revolving around their primaries; except t they have never been seen. If it should be objected that ons which do not "give light by night," can be of no use to the stem, and that therefore such a theory is at variance with the ob-us principles of benevolence, so universally unfolded in the rks of creation, I reply, that they may have uses which we know thing about. Possibly we do not fully apprehend the ultimate es and design of *Luna* herself. If to shed a feeble light on the rld during the hours of *sleep*, was the only reason for the creation such a body, how are we to account for Venus on one side of us, d Mars on the other, being destitute of such attendants? I sup-se, then, there may be at this moment hundreds and thousands of ese invisible attendants, hovering around this planet of ours, and rcling its "huge circumference" with the rapidity of thought.

That such bodies might exist in our system, without being visible, apparent from several considerations. First, they may be so *all* as to be imperceptible. It is said that forty seconds of a de-ee is the least angle under which any object can possibly be seen. globe 500 feet in diameter and 500 miles distant, would scarcely btend that angle. Another difficulty would be, the great velocity, pparent as well as real, of the body in question. The periodical evolution of a globe, five hundred or a thousand miles distant, in-tead of days would have to be told in minutes. Again, nearly half the orbit of such a body, even at the greatest distance named, ould be through the shadow of the earth, and the body itself, course unilluminated. But a small portion of the illuminated rt of the orbit could ever be above the horizon, to an observer in roper circumstances to see it, that is, in the *night*. Besides, even en, the illuminated side of the body would be mainly turned away om the observer.

The atmosphere of the earth, although its density is unappreciable beyond forty or fifty miles, reaches to an indefinite extent. The moon herself affords evidence of having to traverse a resisting medium. There is satisfactory reason for believing the moon to be nearer the earth now than it was some two thousand years ago; the necessary result of atmospheric resistance. Now to account for the approximation and final impact of these meteoric bodies with our earth, I suppose them, like the moon, to have been moving in a slightly resisting medium; though from their greater proximity to the earth, their resistance must have been much more considerable than that of the moon. Thus, by a slow but steady operation of this cause, they are continually brought nearer and nearer, and at the same time meet with greater and greater resistance until at last, they are compelled to quit the orbit they have so long been struggling to maintain, and plunge at once into the grosser elements of our atmosphere, and in scattered fragments, end their career upon the surface of our globe.

The *heat* of meteorites is undoubtedly occasioned by friction in passing through the atmosphere, as stated in the article already alluded to. Hence their ignition and subsequent explosion are readily accounted for.

L. W. P.

THE ADVOCATE OF SCIENCE.

Ninth Month 26, 1833.

Such of our subscribers as do not receive their papers regularly by mail, would oblige us by giving information of the circumstance; and we will try to transmit them by some more certain medium. We have suffered extremely by negligence of duty in the post office department: a whole set of our papers mailed to a subscriber several weeks since, never reached its destination.

In the last number of our paper, the weather Journal was headed for the 9th, instead of the 8th month.

We are glad to hear again from our correspondent Q. His dialogue shall appear in our next.

In our present number we commence the publication of Cuvier's system of Classification, as presented by "Aranea." We are pleased with his project of following up the delineation with a series of essays on the animals of each order. They will prove of great interest and utility to the student of natural history.

We publish in our present number a communication respecting shooting stars. All theories respecting their origin, must necessarily be a product of speculation; and as a piece of speculative reasoning, it accords generally with our own views. But there is one idea the writer expresses, which is totally new to us:—that there is satisfactory reason for believing the moon to be nearer the earth now than it was some two thousand years since. We would like to hear from him again on this point. All the planets are subject to eccentricities of their orbits; and by virtue of this the moon may occasionally be a little nearer the earth: but to assert that approximation is continual, is to say that at some future day the moon and the earth will be brought into contact with each other; and this involves, not the existence of the earth and moon alone as separate planets, destined to an infinite continuance, but the existence of the whole solar and perhaps the celestial system. It has been proved by Lagrange and Laplace, that no disturbances of the planets can take place, save those which alternately increase and decrease. This proves that our system is stable, involving in itself no principle of destruction; but it is calculated to endure for ever, unless an application is made of a power foreign to any which influences it at the present time.

In the essay we gave on shooting stars, in numbers 17 and 18, we mentioned a meteor of an unusual nature, which moved in a regular and horizontal manner, from W. to E. On the 27th inst. (the day after our publication day) we observed another similar to it, but somewhat larger. It looked very much like Mars, and the halo of light which surrounded it was about two feet in perpendicular, and one in transverse diameter. Its direction was E. *b.* S. A friend informed

us he has seen two of the same kind proceeding from E. to W. May not this class of meteors be composed of a cellular substance, and does not the gas or rarefied air incident to its combustion, and confined in its cellules, support it in its horizontal direction?

PEOPLING OF FISH PONDS.

It is a well known fact, that a pond of water formed in the interior of a country becomes in a short time tenanted by fish, of a kind which inhabit the waters at some distance. Intelligent and scientific men have been at a loss to account for the circumstance, while the ignorant suppose the animals to have fallen in the rain. Some have adduced the fact in support of the obsolete doctrine of equivocal generation, presuming the fish to be the spontaneous production of the water. Ellis informs us that small fish are sometimes found in the South Sea islands, in ponds of rain water, and that the natives wonder how they got there, and call them *rain drops*, in allusion to the prevailing opinion respecting their origin.

There is a fact stated in Turner's History of the World, which seems to explain the phenomenon; or at least to throw some light on it. A species of beetle, which inhabits rivers and lives on the eggs of fish, sometimes climbs the high reeds and takes wing. One being caught in its flight and put in water, emitted the eggs with which it was gorged. Some partly digested, and some not at all. *The eggs produced various sorts of fish.*

Now it would be an easy matter for one of these beetles to be conveyed by the winds or some other means, to a considerable distance. Besides other animals, such as water fowls, are known to devour the eggs of fish, and may therefore be one of the agents of nature in peopling distant waters. We know that provision of a similar kind is very bountifully made, both in respect to animals and vegetables. Scarcely a spot on the globe is without its tenants, the origin of which would have been, and has been, an object of surprise and marvel and strange speculation, before the eye of some scientific observer has revealed the mystery.

GOLD REGION IN NEW ENGLAND.

It appears by an article in Silliman's Journal, that gold has been found in the southern part of Vermont, and is expected to be found in Massachusetts. We should consider this discovery an unfortunate one. Generally speaking, gold hunting is like lottery adventure, lucrative to a few and injurious to many. In a moral point of view it is still worse. Iron or coal mines conduce more to the real benefit of a people. Had the mines of England, instead of being stored with iron, tin, copper, coal &c. furnished an amount of gold or silver equivalent in pecuniary value, Great Britain would probably have been a dependant island, and her inhabitants ignorant, effeminate and slothful.

DR. GODMAN'S RAMBLES OF A NATURALIST.

(*Continued from page* 94.)

We consider the habit of attentive observation as one of the most important, and necessary to be acquired. To the naturalist, it is indispensable; and every person may see the advantages a naturalist retains over one who has never made use of his eyes, while passing through a world replete with interesting and instructing objects. Dr. Godman, in one of his rambles along Turner's Lane, stopped to look upon some mowers; and we hope none of our fair readers, who have been accustomed to faint at the *sight* of a mouse, will quarrel with us for quoting the result of his curiosity; for it is certainly interesting.

"The reader may recollect, that, in my first walk, a neat burrow in the grass, above ground, was observed, without my knowing its author. The advance of the mowers explained this satisfactorily, for in cutting the long grass, they exposed several nests of field mice, which, by means of these grass covered alleys, passed to the stream in search of food or drink, unseen by their enemies, the hawks and owls. The numbers of these little creatures were truly surprising; their fecundity is so great, and their food so abundant, that were they not preyed upon by many other animals, and destroyed in great numbers by man, they would become exceedingly troublesome. There are various species of them, all bearing a considerable resemblance to each other, and having to an incidental observer much of the appearance of the domestic mouse. Slight attention, however, is requisite to perceive very striking differences, and the discrimination of these will prove a source of considerable gratification to the inquirer. The nests are very nicely made, and look much like a bird's nest, being lined with soft materials, and usually placed in some snug little hollow, or at the root of a strong tuft of grass. Upon the roots and seeds these nibblers principally feed; and where very abundant, the effects of their hunger may be seen in the brown and withered aspect of the grass they have injured at the root. But under ordinary circumstances, the hawks, owls, domestic cat, weasels, crows &c. prevent them in such limits, as keep them from doing essential damage."

But he found another kind of mouse, known by the name of the jumping mouse;—Gerbilus *canadensis*. Its history is very curious. He was drawn to the spot by the mowers, whose actions and loud laughter indicated some unusual circumstance was transpiring.

When I approached, I found that the object of chase was a jumping mouse, whose actions it was truly delightful to witness. When not closely pressed by its pursuers, it ran with some rapidity in the usual manner, as if seeking concealment. But in a moment it would vault into the air, and skim along for ten or twelve feet, looking more like a bird than a little quadruped. After continuing this for some time, and nearly exhausting its pursuers with running and falling over each other, the frightened creature was accidentally struck down by one of the workmen, during one of its beautiful leaps, and killed. As the hunters saw nothing worthy of attention in the dead body of the animal, they very willingly resigned it to me; and with great satisfaction I retreated to a willow shade, to read what nature had written in its form for my instruction. The general appearance was mouse-like; but the length and slenderness of the body, the shortness of its fore limbs, and the disproportionate length of its hind limbs, together with the peculiarity of its tail, indicated its adaptation to the peculiar kind of action I had just witnessed. As one of this little creature vaulting or bounding through the air, strongly reminded me of what I had read of the great kangaroo of New Holland; and I could not help regarding our little jumper as in some respects a sort of miniature resemblance of that curious animal. It was not evident, however, that the jumping mouse derived any aid from its tail, which so powerfully assists the kangaroo. Though long and sufficiently stout in proportion, it had none of the robust muscularity which, in the New Holland animal, impels the lower part of the body immediately upward. In the mouse, the leap is principally, if not entirely effected by a sudden and violent extension of the long hind limbs, the muscles of which are strong, and admirably suited to their object. We have heard that these little animals feed on the roots of the green herbage, and that they are every season to be found in the meadows.

The jumping mouse, when the chill weather begins to draw nigh, digs down about six or eight inches into the soil, and there forms a little globular cell, as much larger than his own body as will allow a sufficient covering of fine grass to be introduced. This being obtained, he contrives to coil up his body and limbs in the centre of the soft dry grass, so as to form a complete ball; and so compact is this, that when taken out, with the torpid animal, it may be rolled across a floor without injury. In this snug cell, which is soon filled up and closed externally, the jumping mouse securely abides thorugh all the frosts and storms of winter, needing neither food nor fuel, being utterly quiescent, and apparently dead, though susceptible at any time of reanimation, by being very gradually stimulated by light and heat.

Gen. Davies mentions some workmen in Canada having found one of these animals twenty inches under ground, completely embedded in a ball of clay. The clay ball was accidentally broken, and he conveyed the animal to his house, and placed it on some cotton in a room where fire was continually kept. But he could not succeed in reanimating it: it died, and he had it stuffed. Dr. Benjamin Smith Barton, in the Transactions of the Philosophical Society, speaks of one which had been sent to him from the vicinity of Philadelphia. He calls it Dipus *Americanus*. It passed into its torpid state about the 22d of November, though the weather was unusually mild for the season, and the animal was confined in a warm room, in which a fire was kept a greater part of the day and night. He sometimes roused it from its torpid state; at other times it came spontaneously out of it. It ate and drank during the intervals of its waking, and was frequently most active when the weather was extremely cold in December. When he placed it in the open air, under a jar which stood upon a cake of ice, its actions seemed wholly directed to making a comfortable habitation out of the hay with which he supplied it. It was finally killed by the application of too much heat while in its torpid state. We do not understand why torpid animals should be killed in this manner, unless it be that the heat operates as a sudden and powerful stimulant, and overcomes them by the excess of vital action.

Dr. Barton thought it sufficiently evident that cold was not the only cause of the torpidity of this animal; and he conceives the state of torpidity is altogether an "accidental circumstance," constituting by no means a specific character: for in addition to the same species becoming torpid in one country and not in another, different individuals of the same species become torpid or continue awake in the same neighborhood, and even on the same farm. As we contemplate at no very distant period, giving our readers some essays on the subject of hybernation which we have had partially prepared for a long time, we will not here pursue this part of the subject further than to quote another fact from the doctor's essay that gardeners and others near the city call the Gerbilus the "seven sleepers," and assert that it is frequently found in the earth at the lower extremity of the horseradish, and other perpendicular roots; and he inquires, "does it use them as

measure of the distance to which it shall go in the earth, to avoid the influence of the frost?" We should reply not; unless this circumstance is universal among them: for if instinct can teach them, in some cases, the proper depth to which they should retire for this purpose, without the aid of a root, why, in other cases, do they resort to it for a proper measure of their distance? Besides, these roots do not always penetrate so deep in the ground as to place their lower extremity beyond the reach of frost.

Dr. Barton discovered another species, which he calls the *mellivorus*, from the circumstance of its taking possession of the hive of bees, in which it forms for itself a warm and comfortable habitation, having ingeniously scooped away some wax; the materials of its nest being fine dry grass, down or feathers and old rags. They live on the honey, and grow very fat. Two individuals, a male and female, commonly inhabit one hive, and sometimes devour a greater part of its honey. He says the D. *Americanus* also makes these innovations on the habitations of the industrious bee.

For the Advocate of Science.

FRANKLIN'S FAMILIAR LETTERS.

(*Concluded from page* 101.)

An impression prevails respecting the social disposition of Dr. Franklin, that he was wanting in affection towards his friends and relatives—that the feelings of his heart were lost in the occupations of the cold phlegmatic philosopher. I have seen nothing so well calculated to dissipate such an impression, as many of these letters. Although he had many brothers and sisters, all but two of them died before he arrived at eminence in the world. A letter to his surviving sister contains this paragraph:—

"It is remarkable, that so many breaches by death should be made in our family in so short a space. Out of seventeen children, that our father had, thirteen lived to grow up and settle in the world. I remember these thirteen (some of us then very young) all at one table, when an entertainment was made at our house, on occasion of the return of our brother Josiah, who had been absent in the East Indies, and unheard of for nine years. Of these thirteen, there now remain but three. As our number diminishes, let our affection to each other rather increase; for, besides its being our duty, 'tis our interest, since the more affectionate relations are to each other, the more they are respected by the rest of the world."

An evidence of his affectionate attachment to a young lady with whom he became acquainted in England, appears in a letter which he wrote to her just before sailing for America:—

"Our ships for America do not sail so soon as I expected; it will be yet five or six weeks before we embark, and leave the old world for the new. I fancy I feel a little like dying saints, who, in parting with those they love in this world are only comforted with the hope of more perfect happiness in the next. I have, in America, connexions of the most engaging kind, and, happy as I have been in the friendships here contracted, *those* promise me greater and more lasting felicity. But God only knows whether these promises shall be fulfilled."

And again, on the same occasion he writes:—

"Adieu, my dearest child. I will call you so. Why should I not call you so, since I love you with all the tenderness of a father? Adieu. May the God of all goodness shower down his choicest blessings upon you, and make you infinitely happier, than that event would have made you. And wherever I am, believe me to be, with unalterable affection, my dear Polly, Your sincere friend," &c.

There is a felicitous manner of expression in the following passages from letters which he wrote to America before leaving France, when he felt that life was ebbing:—

"I still exist, and still enjoy some pleasure in that existence, though now in my seventy-ninth year. Yet I feel the infirmities of age come on so fast, and the building to need so many repairs, that in a little time the owner will find it cheaper to pull it down and build a new one."

And again a year afterwards:—

"As I may not have another opportunity before my arrival in Philadelphia (if it pleases God I do arrive,) I write these particulars to go by way of England, that you may be less uneasy about me. I did my last public act in this country just before I set out, which was signing a treaty of amity and commerce with Prussia. I have continued to work till late in the day; 'tis time I should go home, and go to bed."

To the same individual he gives this excellent counsel:—

"In fine, nothing can contribute to true happiness, that is inconsistent with duty; nor can a course of action, conformable to it, be finally without an ample reward. For, God governs; and he is *good*. I pray him to direct you; and, indeed, you will never be without his direction, if you humbly ask it, and show yourself always ready to obey it."

I will conclude my hasty glance at this entertaining volume, with a letter to a clergyman in Boston, written in 1786, in his eighty-third year. One cannot but feel a little surprised that a person of so much republican simplicity as Dr. Franklin, should yield to a custom so adverse to his usual manners, as to employ the fashionable phraseology with which his name is subscribed to this letter. He frequently objected to the application of *compliments* to himself. In his eighty fourth year, he wrote to a relation: "I shall make the addition you desire to my superscriptions, desiring in return that you will make a subtraction from yours. The word *Excellency* does not belong to me, and *Doctor* will be sufficient to distinguish me from my grandson." The letter referred to is dated Philadelphia 31st May, 1788, and is as follows:—

"I received your obliging favor of the 6th instant by Mr. Hilliard, with whose conversation I was much pleased, and would have been glad to have had more of it, if he would have spared it to me; but the short time of his stay has prevented. You need make no apology for introducing any of your friends to me. I consider it as doing me honor, as well as giving me pleasure.

"I thank you for the pamphlet of the Humane Society. In return please to accept one of the same kind, which was published while I resided in France. If your Society have not hitherto seen it, it may possibly afford them useful hints.

"It would certainly, as you observe, be a very great pleasure to me, if I could once again visit my native town, and walk over the grounds I used to frequent when a boy, and where I enjoyed many of the innocent pleasures of youth, which would be so brought to my remembrance, and where I might find some of my old acquaintance to converse with. But when I consider how well I am situated here, with every thing about me, that I can call either necessary or convenient; the fatigues and bad accommodations to be met with and suffered in a land journey, and the unpleasantness of sea voyages to one, who, although he has crossed the Atlantic eight times, and made many smaller trips, does not recollect his having ever been at sea without taking a firm resolution never to go to sea again; and that, if I were arrived in Boston, I should see but little of it, as I could neither bear walking nor riding in a carriage over its pebbled streets; and, above all, that I should find very few indeed of my old friends living, it being now sixty-five years since I left it to settle here;—all this considered, I say, it seems probable, though not certain, that I shall hardly again visit that beloved place. But I enjoy the company and conversation of its inhabitants, when any of them are so good as to visit me; for, besides their general good sense, which I value, the Boston manner, turn of phrase, and even tone of voice, and accent in pronunciation, all please, and seem to refresh and revive me.

"I have been long impressed with the same sentiments you so well express, of the growing felicity of mankind, from the improvements in philosophy, morals, politics, and even the conveniences of common living, and the invention and acquisition of new and useful utensils and instruments; so that I have sometimes almost wished it had been my destiny to be born two or three centuries hence. For invention and improvement are prolific and beget more of their kind. The present progress is rapid. Many of great importance, now unthought of, will before that period be produced; and then I

might not only enjoy their advantages, but have my curiosity gratified in knowing what they are to be. I see a little absurdity in what I have just written, but it is to a friend, who will wink and let it pass, while I mention one reason more for such a wish; which is, that if the art of physic shall be improved in proportion to other arts, we may then be able to avoid diseases, and live as long as the patriarchs in Genesis; to which I suppose we should have little objection.

"I am glad my dear sister has so good and kind a neighbor. I sometimes suspect she may be backward in acquainting me with circumstances in which I might be more useful to her. If any such should occur to your observation, your mentioning them to me will be a favor I shall be thankful for. With great esteem, I have the honor to be, Reverend Sir, Your most obedient, and most humble servant, B. FRANKLIN."

SCRUTATOR.

For the Advocate of Science.

ANSWERS TO BARBARA.

"Why does a shower of rain avoid a dry section of country, preferring to visit a part in which rain has recently fallen?"

Answer:—It is evident that there exists a considerable difference between the state of the atmosphere in the two situations. Where rain has recently fallen, the air must contain more moisture, and also suffer some modification of temperature. These causes will produce an impression on the electrical condition of the air. As electrical agency is always more or less connected with the formation of clouds, it follows that the two sections of country stand in very different relations to the cloud which gives the shower. This cloud, instead of increasing, diminishes and is dissipated, or at least withholds its rain, in the atmosphere of the one, while it continues to form, and to give out rain in the other. This is equivalent to a positive attraction between the latter region and the cloud. But it is very probable that there also exists an attractive force between the two, depending on electrical excitation.

"2. Why does a shower, or a thundergust often follow the course of a river?"

Answer:—A river or body of water produces the same effect on the circumambient air as the moist land just referred to. The same principles apply therefore to the solution of this question.

"2. What is the cause of the equinoctial storm?"

Answer:—An erroneous impression prevails, that a particular or special storm is liable to occur in celebration of the sun's crossing the equator. The circumstance of the sun's position has nothing to do with it; and a storm is just as likely to occur one week or two weeks before or after the equinox, as at that precise period. At the times of the vernal and autumnal equinoxes, the season is about changing. At the one time, there is a struggle between winter and spring; at the other, between summer and autumn. Hence we have near each equinox, a period of several weeks in duration, liable to storms; and which ever of these storms occurs nearest to the time of the sun's crossing the line, is the equinoctial storm.

"4. Why have thundergusts and electrified clouds been so rare of late, while they were so frequent earlier in the summer?"

Answer:—The most frequent cause of electrical excitement is the irregular rarefaction of the atmosphere consequent on its irregularity of temperature. Early in the summer, before the warmth of the sun has penetrated the northern forests, the air in our region is liable to become very hot; while a short distance northward, or near the mountains, it continues cold. Currents are thus established which mingle the different atmospheres, producing clouds and electrical disturbances. As the summer advances, the temperature becomes more uniform and settled, and less irregularity in the density of the air is the consequence. This is proved by the Barometer, which has less range at this time than at any other period of the year.

"5. Is the approaching winter to be a warm or cold one?"

Answer:—It would require several months to give a correct reply to this query. I have not yet seen the goose's bone, and if I had, probably Barbara would not be goose enough to believe its indications. There are, nevertheless, several data on which we may found an opinion; such as the character of the several past winters and that of the present summer. We rarely have more than two severe winters in succession. A moderate, open winter is apt to occur every few years. The last five winters have been rather cold, and hence the chances in this respect, are in favor of a mild winter. The temperature of the summer appears to have less relation to the ensuing winter than its quantity of rain. Dry summers and autumns are very apt to be followed by warm winters, and vice versa. The present summer has not been remarkable either for rain or drought, and is therefore not calculated to throw much light on the future. On the whole, it would probably be best to conclude, as regards this question of Barbara, that we know nothing about it.

ÆOLUS.

For the Advocate of Science.

If you are not supplied with answers to the questions of "*Quæsitor*," the following are at your service.

"1. Does the surface of a stream of water run faster than the basis?—If so, what is the cause."

Answer:—I presume there can be no doubt of the affirmative, and for this reason. In whatever part of the current, the particles of water meet with the least resistance from friction, there the current is strongest. Now there are two causes which tend to obstruct the flow of the water; the friction of the earth or bed, and that of the air. The latter is so trifling as not to be worth taking into the account. The former is of main importance; and those portions of the current which are farthest from the bed, consequently move with the greatest rapidity. Thus the current of a stream is always found to be strongest about the middle.

"2. Is not a chain of three or more links as liable to break as a chain of only one link, drawing the same weight?"

In considering this question, it is to be presumed that the same quantity of metal is supposed to enter into the composition of the two chains.—I answer, no.

In explaining my reasons for this conclusion, I will regard the links as circular, or forming exact circles; for I believe the same principles will apply to links of this form, as to any other. It will also be remembered, that the large link, and the small ones, are of the same thickness of metal—that is, made of the same bar. For it will be found that the circumference of a single circular link is just the same as the sum of the circumferences of any number of smaller links of the same shape, sufficient to form a chain of the same length. The question then resolves itself into this: Is not a large iron ring capable of supporting as much weight as a small one, of the same thickness?—I apprehend that most persons would reply in the negative, without stopping to inquire into the philosophy of the subject.

It appears to me that which ever of the two rings is most easily bent out of the circular form by a weight attached to it, would be most easily broken. The larger ring would certainly be most easily bent.

A link in supporting a weight acts somewhat on the principle of the arch. The force is not felt precisely in the direction in which it is applied. But the opposite points of the circumference of the link, situated exactly between the points at which the force is applied, tend to approximate each other. Every one knows what is the effect of pulling an iron hoop in opposite directions, by opposite points of its circumference. This tendency to change of shape bears some proportion to the size of the hoop or link, *increasing* as the quadrant increases between the point of the application of force, and the points at which the tendency to approximate is most powerfully felt. Hence it follows, that the larger the hoop or ring is, the more easily is it bent and broken.

I suppose "Quæsitor" has some explanation in reserve on this subject, which I would like to see. I am aware that my attempted solution does not enter far into the principles of mechanics, and may be erroneous. If so, I would be glad to be set right.

RUSTICUS.

DR. DIXON, THE AFRICAN TRAVELLER.

From the London Morning Herald, Aug, 8.

Extract of a letter dated Cape Coast Castle, 26th April, 1833.

"I fear I have been guilty of great neglect in not sooner communicating to you the result of my inquiries respecting the fate of Dr. Dixon. These particulars I shall, however, now briefly recapitulate to you, that you may be able to answer any inquiries on the subject; on their correctness I believe you may perfectly rely.

"His Majesty's ship Brazen, having Captain Clapperton and the expedition on board, on her voyage down the coast to Bagadry, (from whence it was intended the expedition should start,) touched at Whydah, a small town on the Dahomey coast. Here the gentlemen of the expedition landed, and were hospitably entertained by a Senhor de Souza, the most notorious and extensive slave dealer on the coast of Africa. While here, Dr. Dixon expressed a strong desire to penetrate into the interior through Dahomey, so as to rejoin Capt. Clapperton and his companions at Katunga, or, as it is called on the coast Eyeo. M. de Souza readily offered his services, and actually accompanied the Doctor to the Court of Dahomey, at an immense expense to himself, being obliged when visiting the king, to make him large and valuable presents. Dr. Dixon was well received by the king, who swore not only to protect him while passing through his own dominions, but to use his power and influence to procure for him similar favor and protection from those chiefs through whose dominions he must need pass. The Doctor accordingly left Dahomey, well escorted, and the king, or chief, into whose country he was about to enter, having also sworn to afford him every protection and assistance, he had every prospect of being able to reach Katunga long before Capt. Clapperton. There it was, however, that his ignorance of the customs of the country, and impatience or irritability of temper, cost him his life. When approaching the principal town, the king attended by his sons and chiefs, came out, as is customary, to meet him; and the king desired his eldest son to swear fidelity to the stranger, after the fashion of the country. You will, perhaps, recollect that this is done in this part of Africa by the party drawing a sword, or kind of sabre (more like a bill hook than any thing else,) and making a long harangue, using all the while the most violent and angry like gestures, and pushing the point of the sword almost down the throat of the party in whose favor the oath is taken: in fact they show their dexterity by cutting close on the face without actually touching it. Doctor Dixon unfortunately misunderstood the meaning and nature of the whole ceremony, and conceiving, from the gestures and appearance of the king's son, that he meant to kill him, drew his sword and plunged it into his body. Instantly all was in an uproar, and the Doctor would, of course, have been sacrificed on the spot, had not the king interfered, and ordered him to be guarded into the town, declaring that he could not break his oath, even although his own son had been stabbed;—it was, besides, against the "Fetish" of the country to shed blood in the king's presence. Dr. Dixon was ordered to leave the country the next morning, and with an escort from the king proceeded on his journey accordingly. The instant, however, that he had passed the boundaries of the king's dominions (when, according to their ideas, the king's oath was no longer binding,) his escort fell upon him and murdered him.

"This I have reason to know is a true and correct account of Dr. Dixon's lamentable fate."

MISCELLANIES.

1. *Effect of prejudice on taste and fashion.*—In the time of Louis XIV. the French government, with a view to bring into discredit the India cloth sold at France by the English, ordered that the executioner should dress in it every time he had occasion to hang any one. In America, we observe the fashion to succumb to a different kind of prejudice—the adoption of these by the common people. As soon as the lower classes, especially those of the African variety, fall in with fashionable articles of costume, our exclusives fall out with it, and hunt up some new thing.

2. *Peculiar nature of the concussion produced by sound.*—Plutarch relates that when Quintus Flaminius, the Roman governor of Greece, in the name of Rome restored liberty to Greece, the force of the ascending shouts and acclamations so rent the air, that ravens which were flying above the assembly at the time fell dead. This statement of Plutarch has been doubted by many, but appears to be credited by Flint in his "Lectures," who attributes it to the concussion produced by sound on the atmosphere. We are not disposed to give credence, because of the fact that sound propagated by the air only, imparts concussion to substances of a particular kind, or in particular situations. A window with closed sashes is shattered by the explosion of gunpowder, when it might have escaped had the sash been hoisted so as not to impede the impulse of the concussion. Doors similarly situated are also forced open by such explosions. In these cases however, the effect is to be ascribed particularly to the motion of the atmosphere independent of sound. Not so the report of artillery, which acts almost entirely by means of the *sound*, precisely as the shouts of the people in the case in question. Now, the firing of cannon, although it shatters glass, produces not the least perceptible motion on the lightest feather; showing, that the effect of the report is influenced by the elasticity of the bodies. Judging from this fact, we are disposed, as we have remarked, to doubt the assertion of Plutarch, and of course the explanation given by Flint.

3. *Coal.*—The extent and thickness of the coal strata, in various places, seem to preclude the reasonable supposition that such amounts of vegetable matter should have been accumulated at one epoch. Is it not more natural to suppose that carbon is an original, elementary constituent of the globe? Let us consider the fact, that limestone is one of the most abundantly distributed of all the classes of rocks. Every one knows that carbonic acid constitutes a large proportion of the composition of this rock. The quantity of pure carbon in limestone, amounts to nearly one-eighth of its whole mass. Were the carbon disengaged from the limestone in calcareous ranges, it would form an immense bed of carbon proportionate to the thickness of the limestone stratum; but out of proportion thicker than any coal stratum known to exist. Is it not, therefore, as natural to suppose that some great and simultaneous chemical action disengaged the carbon from the lime, and left it in such strata as we see actually accompanying coal, as that nature was compelled to resort to the circuitous operation of accumulating vegetable matter, and then by another process to convert it into coal? In a word, why is it not as probable that carbon was the original formation, as limestone?—*Flint's Lectures.*

4. *Discovery of glass.*—The account of the origin of glass, which Pliny has handed down to us is extremely plausible. A merchant vessel, laden with mineral alkali, having been driven ashore on the coast of Palestine near the river Belus, the crew went in search of provisions, and accidentally supported the kettles, upon which they dressed them, upon pieces of the mineral alkali. The river sand, on which this operation was performed, was vitrified by its union with the alkali, and thus produced glass. The important hint, thus accidentally obtained, was soon adopted, and the art of making glass gradually improved.—*Ibed.*

5. *Theories of the tides.*—The celebrated Kepler, who believed

the earth to be a living animal, supposed the flux and reflux of the sea to be the effect of his respiration; as Blackmore, in verses intended to be sublime, describes the eruptions of Ætna, as the result of a fit of the colic in the bowels of the mountain.

6. *Extraordinary Earthquake.*—The Montreal Gazette of the 31st ult. contains an account of an earthquake that recently happened at St. Leon, in the District of Three Rivers, which if true, is one of the most remarkable on record. Its extent is said to have been limited to about fifteen acres.

It is impossible says the Minerva, giving the details of the occurrence, to describe the scene of desolation which the spot now presents; all is overthrown and fallen to the banks of the river. The house and barn of Isaas Lesage have sunk in, as also the house and barn of Augustin Ferron. Isaac Lesage is now dead, from having been crushed under the ruins of the house. His wife, who had gone to milk the cows, saw the house sinking in. An old man saved himself with several children by getting out by the roof. The body of Lesage has been found dreadfully mangled. The house has so sunk into the earth, that nothing but the head of the chimney is visible. The barn has entirely disappeared.

The family of Lesage, who have also lost all their provisions and most of their property are in a great state of privation. It is said that a large cross, erected on the road side as is customary through the devotion of the inhabitants, was conveyed to a great distance without falling and is even more perpendicular than it was before. The whole of the accident occurred within a short distance of the Church of St. Leon.

7. *Daniel Dancer, Esq.*—Once on a time this celebrated miser was prevailed upon to purchase an old hat from a Jew, for which he paid a shilling; having worn his own for no less than three years. A relation, who had instigated him to this act, calling to see him the next day, was much surprised on seeing his old chapeau mounted on his head. On inquiring, it appeared he had induced his old servant to purchase the *new* hat at the advanced price of eighteen pence, and he congratulated himself on his dexterity in clearing six pence by his bargain. Such is the brutish avarice of the human character, when uncontrolled by judgment and reason.

8. *Strange Animal.*—An animal of strange cognomen has been repeatedly seen in and about the woods of Hadley (Upper Mills) exciting no little curiosity in that vicinity. He is represented as larger than a fox, of a brindle color, long hind legs, and short front ones, and belongs to no species known about here. He is rather ferocious, and when seen in the road by two men between the Upper Mills and Sunderland, he growled angrily, and seemed disposed to act on the offensive. No hunters have been able to get a shot at him, but dogs have been vanquished and they refuse to renew the attack again. He is thought to be a species of the Kangaroo, going upon his long hind legs, by skipping and jumping. A general hunt is to be attempted in a few days. If successful, we may then learn something more minute about him.—*Northampton Courier.*

9. *Strange Fish.*—During our short absence from this town, two very singular fish were taken by our fishermen.—One was 8 feet long, 25 inches wide and 15 inches thick, and weighed 690 lbs.; the other was 7 feet in length, 18 inches in breadth and 9 inches in thickness, and weighed 175 lbs. They were regularly skinned and sold in market, and soon the name of river hog was affixed to them, from the great resemblance of their harslet to a hog's, as well as their flesh, which bore the appearance of fat pork—a thought, has since struck us, that this fish may be a species of the Sturgeon—but having no book of reference, we must leave the matter undecided.—*Liberia papers.*

Strange fish again.—Since penning the above article, we have learned that these fish were taken in a seine by J. Woodland and others in the Messurado river: that their skins were of a darkslate color, and of considerable thickness, viz: ½ inch; that their flesh resembled fat pork, and tasted like it—that they had mouths like a hog, and a set of molar teeth, but their snouts were somewhat broader and well fitted to root in the mud. They had also two large lateral fins and no dorsal, with tails horizontal. We conceive the name bestowed on them by our citizens, not altogether inappropriate; and our only regret is, that we were absent at the time: as owing to the sickness of Governor Mechlin, no steps were taken to preserve their heads and skins for the examination of our scientific friends in America.—*Ib.*

10. *Barbarian barbers, or shaving in the South Sea Islands.*—Before the introduction of the arts of civilized life among the Tahitians, the natives, according to Ellis, plucked out their beard by the root, or shaved it with a shark's tooth, or by cutting it off with two shells acting like the blades of scissors. But recently they have improved in this respect. There are no barbers by profession, though each man shaves his neighbor. A few only can see the propriety of using soap. The person to be shaved lies flat down on his back, while his friend kneels over him with the razor. When he has finished, he lays down in turn to be shaved by the former. Sometimes when the razor becomes too dull, a whetstone is used, or both get up and go to the grindstone with it; after which the operation is completed, occasionally without any application being made to the razor between the grindstone and the chin.

11. *Value of the products of the globe.*—Estimating the value of the food and clothing of an individual to be only ten dollars annually, the worth of the annual products of our globe consumed by man, would not fall far short of ten hundred thousand millions of dollars. This immense revenue is derived directly and indirectly from the vegetable kingdom.

12. *Discovery of Uranus prior to Dr. Herschell.*—In 1690, an English astronomer discovered Uranus, and registered it as a fixed star. But no one was aware of its being a planet till Dr. Herschell made that discovery.—*Turner's History.*

13. *Rapidity of the flight of birds.*—The swallow is supposed to fly at the rate of a mile a minute, which, according to Wilson, is within the truth. The same writer observes that this little bird is thus engaged on its wing ten hours every day. Our pretty little Blackbird is known to fly in flocks from the Bermudas to the continent in the spring, and to return in the fall to its winter quarters. The distance is at least six hundred miles. Supposing it to fly a mile in a minute, which it can easily do, this long journey would occupy only ten or twelve hours. Those individuals of the genus *homo* who are desirous of learning to fly, may ascertain the practicability of their notions by suspending themselves in the air by grasping some elevated object with their hands. If they are able to hang on for an hour or two, we would advise them *then* to invent some kind of wings.

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